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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/068,492
Filing Date: February 05, 2002
Appellant(s): TSECOURAS, MICHAEL J.

Carlton H. Hoel
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3/9/07 appealing from the Office action mailed 12/13/06.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2002/0180518	MIDYA	12-2002
2001/0033628	SCHUBERT	10-2001
5640697	ORNDORFF	6-1997
5301366	GROSHONG	4-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 11-15, 18-21, 24-25, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schubert et al. (US 2001/0033628) in view of Orndorff (US 5,640,697) and Groshong et al. (US 5,301,366).

As to claim 1, Figures 17 and 31 in Schubert shows a digital amplifier adaptive pulse frame rate frequency control system comprising:

a sample rate converter 600;

a programmable controller 620 operational to generate control data bits (see paragraph 43, lines 1-5 and claim 1); and

a system clock generator 1070 operational to generate a sample rate converter master clock signal in response to the control data bits such that the sample rate converter generates output data at a sample rate determined by the control data bits (see paragraph 46, lines 1-3 and paragraph 50, lines 1-16).

However, the Schubert reference does not disclose a programmable controller operational in response to input frequency data to generate control data bits. The Orndorff reference teaches

a programmable controller operational in response to input frequency data to generate control data bits (see Figure 3, Col. 3, lines 9-15, Col. 5, lines 9-28, Col. 8, lines 12-16, and Col. 11, line 59 to Col. 12 line 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Schubert to comprise a programmable controller operational in response to input frequency data to generate control data bits, as taught by Orndorff, in order to program the controller to respond to inputs for tuning.

The combination of Schubert and Orndorff fails to disclose that the input frequency data to control to which the programmable controller is operational is user selected. However, in an analogous art, Groshong et al. disclose that the input frequency data to control to which the programmable controller is operational is user selected. See FIG. 2 and col. 4, lines 28-40. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Schubert and Orndorff by incorporating the features taught in Groshong et al. for the purpose of using the system in an existing AM or FM radio device.

As to claims 2, 13, and 19, Schubert-Orndorff-Groshong discloses the digital amplifier adaptive pulse frame rate frequency control system according to claims 1, 12, and 18 wherein the programmable controller comprises a data processing device selected from the group consisting of a computer, a digital signal processor, a CPU, and a micro-controller.(Schubert shows the programmable controller as DSP 620 in FIG. 17).

As to claims 3, 14, and 20, Schubert-Orndorff-Groshong discloses the digital amplifier adaptive pulse frame rate frequency control system according to claims 1, 12, and 18 wherein the

system clock generator comprises a frequency controller selected from the group consisting of a digital frequency synthesizer, and a programmable phase-locked loop (FIG. 17 in Schubert shows a programmable phase-locked loop, See paragraph 72, lines 1-4).

As to claims 4, 15, and 21, Schubert-Orndorff-Groshong discloses the digital amplifier adaptive pulse frame rate frequency control system according to claims 1, 12, and 18 wherein the system clock generator is further operational to generate audio clock signals at the sample rate determined by the control data bits (Schubert: see paragraph 178, lines 1-21. If the received signal is audio clock signal, then the system clock generator generates audio clock signals at the determined sample rate).

As to claims 5 and 24, Schubert-Orndorff-Groshong discloses the digital amplifier adaptive pulse frame rate frequency control system according to claims 4 and 18 wherein the system clock generator is further operational to generate sample clock signals at the sample rate determined by the control data bits (Schubert: see paragraph 46, lines 1-3 and paragraph 50, lines 1-16).

As to claim 11, Schubert-Orndorff-Groshong discloses the digital amplifier adaptive pulse frame rate frequency control system according to claim 1 wherein the sample rate converter comprises a digital asynchronous sample rate converter (Schuber: see paragraph 151, lines 1-24).

As to claim 12, Figures 17 and 31 in Schubert shows a digital amplifier adaptive pulse frame rate frequency control system comprising:

a digital asynchronous sample rate converter 600 operational to generate output audio data in response to input audio data, an input audio clock and a master clock;

a programmable controller 620 operational to generate control data bits (see paragraph 46, lines 1-3 and paragraph 50, lines 1-6;

a decoder 862 operational to decode the control data bits (see paragraph 173, lines 1-36); and

a system clock generator 1070 operational to generate the master clock in response to the decoded control data bits such that the digital asynchronous sample rate converter generates the output data at a sample rate determined by the user selected input frequency information (see see paragraph 46, lines 1-3 and paragraph 50, lines 1-16).

However, the Schubert reference does not disclose a programmable controller operational in response to user selected input frequency information to generate control data bits, wherein the input frequency information is selected from the group consisting of wireless, cellular telephone, Bluetooth, RF, IF, LCO, AM, FM, and TV band frequencies. The Orndorff reference teaches a programmable controller operational in response to user selected input frequency information to generate control data bits, wherein the input frequency information is selected from the group consisting of wireless, cellular telephone, Bluetooth, RF, IF, LCO, AM, FM, and TV band frequencies (see Figure 3, Col. 1, lines 13-20, Col. 3, lines 9-15 and 23-30, Col. 4, lines 37-42, Col. 5, lines 9-28, Col. 5, line 44 to Col. 8, line 20, and Col. 11, line 59 to Col. 12 line 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Schubert to comprise a programmable controller operational in response to user selected input frequency information to generate control data bits, wherein the input frequency information is selected from the group consisting of wireless,

cellular telephone, Bluetooth, RF, IF, LCO, AM, FM, and TV band frequencies, as taught by Orndorff, in order to program the controller to respond to inputs for tuning.

The combination of Schubert and Orndorff fails to disclose that the input frequency data to control to which the programmable controller is operational is user selected. However, in an analogous art, Groshong et al. disclose that the input frequency data to control to which the programmable controller is operational is user selected. See FIG. 2 and col. 4, lines 28-40. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Schubert and Orndorff by incorporating the features taught in Groshong et al. for the purpose of using the system in an existing AM or FM radio device.

As to claim 18, what is cited in claim 12 is applicable to this claim 18. Claim 18 is the same as claim 12, except "means" is used in placed of an element (e.g., programmable controlling means in claim 18 versus a programmable controller in claim 12).

As to claim 25, Figure 7 in Schubert shows a method of controlling the pulse-frame rates for a digital amplifier output signal comprising the steps of:

providing a pulse-frame rate frequency control system having a programmable controller 620, a system clock generator 1070, and a digital asynchronous sample rate converter 600 operational to generate output audio data at a first sample rate in response to input audio data and further in response to input audio clocks (see paragraphs 43, lines 1-5);

communicating the control data bits to the system clock such that the system clock generates a master clock for the digital asynchronous sample rate converter at a new sample rate

and further such that the system clock generates output audio clocks at the new sample rate (see and paragraph 50, lines 1-16); and

adapting the digital asynchronous sample rate converter output audio data at a first sample rate to conform to the new sample rate determined by the master clock (see paragraph 50, lines 1-16).

However, it does not disclose communicating user selected input frequency data to the controller such that the controller generates control data bits determined by the user selected input frequency data. The Orndorff reference teaches communicating user selected input frequency data to the controller such that the controller generates control data bits determined by the user selected input frequency data (see Figure 3, Col. 3, lines 9-15, Col. 5, lines 9-28, Col. 8, lines 12-16, and Col. 11, line 59 to Col. 12 line 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Schubert to comprise the step of communicating user selected input frequency data to the controller such that the controller generates control data bits determined by the user selected input frequency data, as taught by Orndorff, in order to program the controller to respond to inputs for tuning.

The combination of Schubert and Orndorff fails to disclose that the input frequency data to control to which the programmable controller is operational is user selected. However, in an analogous art, Groshong et al. disclose that the input frequency data to control to which the programmable controller is operational is user selected. See FIG. 2 and col. 4, lines 28-40. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Schubert and Orndorff by incorporating the features

taught in Groshong et al. for the purpose of using the system in an existing AM or FM radio device.

As to claim 28, Schubert-Orndorff-Groshong discloses the method of claim 25 wherein the step of communicating user selected input frequency data to the controller such that the controller generates control data bits determined by the user selected input frequency data comprises the step of providing a look-up table of pulse-frame frequencies (output digital asynchronous sample rate converter clock generator frequencies) versus station data selected from the group consisting of RF, IF, LCO, AM, FM, TV station, wireless, cellular telephone and Bluetooth frequencies, that can be accessed by the controller to determine the control data bits (Orndorff: see Figure 3, Col. 1, lines 13-20, Col. 3, lines 9-15 and 23-30, Col. 4, lines 37-42, Col. 5, lines 9-28, Col. 5, line 44 to Col. 8, line 20, and Col. 11, line 59 to Col. 12 line 8).

As to claim 29, Schubert-Orndorff-Groshong discloses the method of claim 25 wherein the step of communicating user selected input frequency data to the controller such that the controller generates control data bits determined by the user selected input frequency data comprises the step of providing an algorithm to select pulse-frame frequencies (output digital asynchronous sample rate converter clock generator frequencies) versus station data selected from the group consisting of RF, IF, LCO, AM, FM, TV station, wireless, cellular telephone and Bluetooth frequencies, that can be accessed by the controller to determine the control data bits (Orndorff: see Figure 3, Col. 1, lines 13-20, Col. 3, lines 9-15 and 23-30, Col. 4, lines 37-42, Col. 5, lines 9-28, Col. 5, line 44 to Col. 8, line 20, and Col. 11, line 59 to Col. 12 line 8).

3. Claims 6-10, 16-17, 22-23, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schubert et al. in view of Orndorff, and further in view of Groshong et al. and Midya et al. (U.S. Patent Application Publication 2002/0180518 A1).

As to claims 6, 16, and 22, Schubert-Orndorff-Groshong discloses the digital amplifier adaptive pulse frame rate frequency control system according to claims 4, 15, and 21. However, it does not disclose a digital amplifier responsive to the system clock generator audio clock signals and the sample rate converter output data such that the digital amplifier output switches at a pulse-frame rate determined by the system clock generator audio clock signals and the sample rate converter output data. The Midya reference teaches a digital amplifier responsive to the system clock generator audio clock signals and the sample rate converter output data such that the digital amplifier output switches at a pulse-frame rate determined by the system clock generator audio clock signals and the sample rate converter output data (see Figure 1 and page 1, col. 2, paragraphs [0010] – [0011]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Schubert-Orndorff-Groshong to further comprise a digital amplifier responsive to the system clock generator audio clock signals and the sample rate converter output data such that the digital amplifier output switches at a pulse-frame rate determined by the system clock generator audio clock signals and the sample rate converter output data, as taught by Midya, in order to provide error correction in digital amplifiers.

As to claims 7, 17, and 23, Schubert-Orndorff-Groshong-Midya discloses the digital amplifier adaptive pulse frame rate frequency control system according to claims 6, 16, and 22 wherein the digital amplifier output further switches at a pulse-frame rate to minimize

interference associated with keep-out bands for frequencies related to a desired source (Midya: see page 2, col. 1, paragraph [0012]).

As to claim 8, Schubert-Orndorff-Groshong-Midya discloses the digital amplifier adaptive pulse frame rate frequency control system according to claim 7 wherein the keep-out bands are associated with frequencies selected from the group consisting of AM, FM and TV band frequencies (Orndorff: see Col. 1, lines 13-15, Col. 3, lines 23-30 and Col. 4, lines 37-42).

As to claim 9, Schubert-Orndorff-Groshong-Midya discloses the digital amplifier adaptive pulse frame rate frequency control system according to claim 7 wherein the keep-out bands are associated with frequencies selected from the group consisting of radio frequency (RF), intermediate frequency (IF), and Local Control Oscillator (LCO) frequencies (Orndorff: see Col. 5, line 44 to Col. 8, line 20).

As to claim 10, Schubert-Orndorff-Groshong-Midya discloses the digital amplifier adaptive pulse frame rate frequency control system according to claim 7 wherein the keep-out bands are associated with wireless communication frequencies selected from the group consisting of cellular telephone frequencies and Bluetooth frequencies (Schubert: see Col. 1, lines 7-10 and Col. 5, lines 42-45. Orndorff: see Col. 1, lines 13-20 and Col. 13, line 28 to Col. 14, line 4).

As to claim 26, Schubert-Orndorff-Groshong discloses the method according to claim 25. However, it does not disclose the steps of: providing a digital amplifier having output switching responsive to the digital asynchronous sample rate converter output audio data and further responsive to the output audio clocks at the new sample rate; and communicating the digital asynchronous sample rate converter output audio data and the output audio clocks at the new

sample rate to the digital amplifier such that the digital amplifier operates to change its output switching pulse-frame rate from a first pulse-frame rate to new pulse-frame rate. The Midya reference teaches the steps of: providing a digital amplifier having output switching responsive to the digital asynchronous sample rate converter output audio data and further responsive to the output audio clocks at the new sample rate (see Figure 1 and page 1, col. 2, paragraphs [0010] – [0011]); and communicating the digital asynchronous sample rate converter output audio data and the output audio clocks at the new sample rate to the digital amplifier such that the digital amplifier operates to change its output switching pulse-frame rate from a first pulse-frame rate to new pulse-frame rate (see Figure 1 and page 1, col. 2, paragraphs [0010] – [0011]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Schubert-Orndorff-Groshong to comprise the steps of: providing a digital amplifier having output switching responsive to the digital asynchronous sample rate converter output audio data and further responsive to the output audio clocks at the new sample rate; and communicating the digital asynchronous sample rate converter output audio data and the output audio clocks at the new sample rate to the digital amplifier such that the digital amplifier operates to change its output switching pulse-frame rate from a first pulse-frame rate to new pulse-frame rate, as taught by Midya, in order to provide error correction in digital amplifiers.

As to claim 27, Schubert-Orndorff-Groshong discloses the method according to claim 25 with keep-out bands associated with the frequency group consisting of AM, FM, and TV band frequencies ((Orndorff: see Col. 1, lines 13-15, Col. 3, lines 23-30 and Col. 4, lines 37-42). However, it does not disclose the steps of: providing a digital amplifier having output switching

responsive to the digital asynchronous sample rate converter output audio data and further responsive to the output audio clocks at the new sample rate; and communicating the digital asynchronous sample rate converter output audio data and the output audio clocks at the new sample rate to the digital amplifier such that the digital amplifier operates to change its output switching pulse-frame rate from a first pulse-frame rate to new pulse-frame rate that substantially minimizes interference minimizes interference with keep-out bands. The Midya reference teaches the steps of: providing a digital amplifier having output switching responsive to the digital asynchronous sample rate converter output audio data and further responsive to the output audio clocks at the new sample rate (see Figure 1 and page 1, col. 2, paragraphs [0010] – [0011]); and communicating the digital asynchronous sample rate converter output audio data and the output audio clocks at the new sample rate to the digital amplifier such that the digital amplifier operates to change its output switching pulse-frame rate from a first pulse-frame rate to new pulse-frame rate that substantially minimizes interference minimizes interference with keep-out bands (see Figure 1 and page 1, col. 2, paragraphs [0010] – [0011]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Schubert-Orndorff-Groshong to comprise the steps of: providing a digital amplifier having output switching responsive to the digital asynchronous sample rate converter output audio data and further responsive to the output audio clocks at the new sample rate; and communicating the digital asynchronous sample rate converter output audio data and the output audio clocks at the new sample rate to the digital amplifier such that the digital amplifier operates to change its output switching pulse-frame rate from a first pulse-frame rate to new pulse-frame rate that substantially minimizes interference

minimizes interference with keep-out bands, as taught by Midya, in order to provide error correction in digital amplifiers.

(10) Response to Argument

Appellant states the following: there is no suggestion in Schubert of any programmable controller, user selection to control the sampling rate conversion or generating a clock for the sample rate converters; neither Orndorff nor Groshong suggests user control of sampling rate converters.

Examiner respectfully disagrees with Appellant's arguments.

Schubert discloses a frequency control system 602 that includes a programmable controller, shown as digital signal processor (DSP) 620 in FIG. 17. The DSP 620 includes a digital filter 618 which generates a sample rate control signal on line 612. The decimation filter 610 applies variable ratio decimation to generate a sampled data stream having a variable sample rate. See paragraph 144, lines 1-11. The digital control loop includes an FFT function 614 that extracts components of a pilot tone that are input to a phase detector 616. This phase detector produces a signal that is passed through the digital filter 618 in the DSP 620. See paragraph 145, lines 1-9. In this way, the decimation filter 610 and the phase detector 616 programs the DSP 620. The DSP 620, in turn, generates a control signal. Therefore, the DSP 620 is a programmable controller.

The claims do not recite "user selection to control the sampling rate conversion" or "generating a clock for the sampling rate converters" as argued by Appellant. Although the claims are interpreted in light of the specification, limitations from the specification are not read

into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The These limitations must be recited in the claims to give the limitations patentable weight.

Nonetheless, relevant to these features, Schubert discloses that the frequency control system is useable in a television receiver. See FIG. 13 and paragraph 118, lines 1-9. The television receiver is controlled by users who tune the receiver to desired channels. Schubert also discloses that a clock recovery circuit includes a sample rate converter. See paragraph 46, lines 1-3 and paragraph 50, lines 1-13. Orndorff discloses a programmable controller operational in response to input frequency data to generate control data bits. See Figure 3, Col. 3, lines 9-15, Col. 5, lines 9-28, Col. 8, lines 12-16, and Col. 11, line 59 to Col. 12 line 8. Finally, Groshong discloses a communication system including converters 34 and 36 that are coupled to a digital signal processor 36, and a controller 38 that allows a user to select desired tuning frequencies.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Sam Bhattacharya

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